

WHAT IS CLAIMED:

1. An intravascular embolic protection system comprising:
a guide wire;
5 an embolic filter engageable over the guide wire, wherein the guide wire is deliverable within a vessel independently of the embolic filter; and
a means for limiting translation of the embolic filter over the guide wire,
the means for limiting comprising a first stop mechanism located proximal to the embolic filter when the embolic filter is operatively engaged over the guide wire.
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2. The system of claim 1 wherein the first stop mechanism limits the proximal translation of the embolic filter along the guide wire.
3. The system of claim 2 wherein the first stop mechanism limits the
15 distal translation of the embolic filter along the guide wire.
4. The system of claim 2 wherein the first stop mechanism is located at a distal portion of the guide wire.
- 20 5. The system of claim 4 wherein the first stop mechanism comprises a one-way translation member wherein the sheath is able to translate along the guide wire from a location proximal to the proximal stop mechanism to a location distal of the proximal stop and wherein the sheath is unable to then translate from the distal location to the proximal location.
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6. The system of claim 5 wherein the one-way translation member is deformable.
7. The system of claim 6 wherein the one-way translation member
30 comprises a preformed configuration that is deformable to a low profile configuration and deformable to a high profile configuration.

8. The system of claim 7 wherein the low profile configuration is formed when the sheath is translated over the first stop mechanism in the distal direction.

5 9. The system of claim 7 wherein the high profile configuration is formed when the filter is translated towards the first stop mechanism in the proximal direction.

10 10. The system of claim 7 wherein the one-way translation member is comprised of Nitinol.

11. The system of claim 7 wherein the one-way translation member comprises at least one wire strand.

15 12. The system of claim 7 wherein the one-way translation member comprises a coil having a distally increasing diameter.

20 13. The system of claim 5, wherein the one way translation member includes a male threaded feature.

14. The system of claim 5 wherein the one-way translation member has a substantially fixed configuration.

25 15. The system of claim 14 wherein the one-way translation member has a naturally-biased, high profile position and an unbiased, low profile position.

16. The system of claim 15 wherein the one-way member is spring-loaded when in the unbiased, low profile position.

30 17. The system of claim 16 further comprising a protective sheath having an open proximal end, an open distal end and a lumen extending there

between wherein the protective sheath is disposable over the one-way translation member to retain the member in a low-profile position.

18. The system of claim 16 wherein the one-way translation member
5 comprises a lever.

19. The system of claim 3 wherein the first stop mechanism is located at a proximal portion of the guide wire.

10 20. The system of claim 19 wherein the first stop mechanism comprises a means for locking the axial position of the sheath with respect to the guide wire.

21. The system of claim 20 wherein the means for locking comprises a
15 sleeve positionable over the guide wire.

22. The system of claim 21 wherein the sleeve has a distally increasing diameter.

20 23. The system of claim 21 wherein the sleeve has a threaded lumen.

24. The system of claim 23 wherein the guide wire has a threaded portion that is engageable with the threaded lumen.

25 25. The system of claim 1 wherein the means for limiting further comprises a second stop mechanism located proximal to the embolic filter when the embolic filter is operatively engaged over the guide wire.

26. The system of claim 25 wherein the second stop mechanism
30 comprises an enlargement member.

27. The system of claim 8 wherein the enlargement member is a solder bead.

28. An intravascular embolic protection system for collecting and
5 removing debris from within a vessel, comprising:

a filter attached to a sheath comprising an open distal end, an open proximal end and a guide wire lumen there between;

a guide wire operatively disposed with the guide wire lumen wherein the guide wire is rotatable with respect to the filter and the filter is translatable along
10 the axis of the guide wire, the guide wire comprising a stop mechanism wherein the lumen is not translatable in the proximal direction beyond the stop mechanism.

29. The system of claim 28 wherein the sheath has a length that extends over no more than a distal portion of the guide wire when the filter is
15 operatively positioned at the distal portion of the guide wire.

30. The device of claim 29 wherein the stop mechanism is located proximal to the sheath at the distal portion of the guide wire.

31. The system of claim 30 wherein the stop mechanism comprises a
20 low profile configuration and a high profile configuration.

32. The system of claim 31 wherein the stop mechanism is disposable within the lumen of the sheath when in the low profile configuration.
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33. The system of claim 31 wherein the sheath cannot translate over the stop mechanism in the proximal direction when the stop mechanism is in a high profile configuration.

34. The system of claim 28 wherein the sheath has a length that extends over substantially the length of the guide wire the sheath, when the filter is operatively engaged over the distal portion of the guide wire.
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35. The system of claim 34 wherein the stop mechanism is located at a proximal portion of the guide wire.

5 36. The system of claim 35 wherein the stop mechanism comprises means for locking the translational position of the sheath with respect to the guide wire wherein the filter is not translatable in either the proximal or distal directions when the sheath is locked.

10 37. The system of claim 36 wherein the sheath has a tapered distal end portion.

38. A method of translating an embolic filter disposed over a distal portion of a guide wire operatively positioned within a target location within a target vessel, comprising the steps of:

15 providing a first stop mechanism associated with the guide wire at a location proximal to the distally disposed embolic filter;
translating the embolic filter along the guide wire in the proximal direction; and
20 limiting further proximal translation of the embolic filter by means of the first stop mechanism.

39. The method of claim 38 wherein the first stop mechanism is located at the distal portion of the guide wire.

25 40. The method of claim 39 wherein the step of limiting comprises the step of forming a barrier substantially normal to the longitudinal axis of the guide wire.

30 41. The method of 38 wherein the first stop mechanism is located at a proximal portion of the guide wire.

42. The method of 41 wherein the step of limiting comprises the step of locking the position of the filter with respect to the guide wire.

43. The method of 42 wherein the step of locking comprises the step of preventing the axial translation of the filter along the guide wire.

44. A method for delivering an embolic filter to within a target vessel comprising the steps of:

providing a guide wire having a first stop mechanism; and
delivering a distal portion of the guide wire to a target location within the target vessel; and

translating the embolic filter along the guide wire in the distal direction to a location distal of the first stop mechanism.

45. The method of claim 44 wherein the step of translating comprises the step of decreasing the profile of the proximal stop mechanism.

46. The method of claim 45 wherein the proximal stop mechanism has a dimension substantially normal to the longitudinal axis of the guide wire and wherein the step of decreasing the profile of the first stop mechanism comprises the step of reducing the dimension.

47. The method of claim 46 wherein the first stop mechanism comprises a wire component and the step of decreasing the profile of the first stop mechanism comprises the step of elongating or stretching the wire component.

48. The method of claim 45 wherein the first stop mechanism comprises a lever and the step of decreasing the profile of the first stop mechanism comprises the step of lowering the lever to a position substantially parallel with the guide wire.

49. The method of claim 44 further comprising the steps of:

translating the embolic filter along the guide wire in the proximal direction; and

by means of the first stop mechanism, preventing the embolic filter from translating further in the proximal direction.

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50. The method of claim 49 wherein the step of preventing the embolic filter from further proximal translation comprises the step of increasing the profile of the first stop mechanism.

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51. The method of claim 50 wherein the first stop mechanism has a dimension substantially normal to the longitudinal axis of the guide wire and wherein the step of increasing the profile comprises the step of increasing the dimension.

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52. The method of claim 51 wherein the first stop mechanism comprises a wire component and the step of increasing the profile comprises the step of compressing wire component along the longitudinal axis of the guide wire.

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53. The method of claim 51 wherein the first stop mechanism comprises a lever and the step of increasing the profile comprises the step of biasing the lever to a position at an angle with the guide wire.

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54. The method of claim 44 further comprising the step of fixing the position of the filter with respect to the guide wire by means of the first stop mechanism.

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55. The method of claim 12 wherein the step of fixing the position of the filter comprises the step of locking a proximally extending sheath attached to the filter to a proximal portion of the guide wire.

56. The method of 44 further comprising the step of preventing further distal translation of the filter by means of a second stop mechanism associated with the guide wire.

5 57. A method of delivery, deploying and retrieving an embolic filter within a target vessel used to collect emboli within blood flowing through a target site of an interventional procedure, the method comprising the steps of:

providing a guide wire assembly comprising a guide wire and a first stop positioned at a distal portion of the guide wire, wherein the first stop has a
10 deployed configuration and an undeployed configuration;
delivering the distal end of the guide wire assembly, wherein first stop is in an undeployed configuration, to a location wherein the first stop is distal to the target site;
providing an undeployed filter attached to a sheath;
15 advancing the sheath over the guide wire to a location distal of the first stop;
deploying the filter; and
deploying the first stop.

20 58. The method of claim 57 further wherein the steps of delivering, advancing and deploying are facilitated by fluoroscopic imaging.

59. The method of claim 57 wherein the step of deploying the first stop comprises the step of forming a barrier cross-wise to the guide wire.

25 60. The method of claim 57 further comprising the step of delivering one or more interventional devices to the target site and performing one or more interventional procedures at the target site.

30 61. The method of claim 57 further comprising the step of collecting emboli and/or thrombi released from the target site.

62. The method of claim 61 further comprising the step of retrieving the filter from the vessel.

63. The method of claim 62 wherein the step of retrieving the filter
5 comprises the steps of:
undeploying the first stop;
undeploying the filter; and
translating the undeployed filter in the proximal direction over the
undeployed first stop.

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64. A method of delivery, deploying and retrieving an embolic filter within a target vessel used to collect emboli within blood flowing through a target site of an interventional procedure, the method comprising the steps of:
providing a guide wire assembly comprising a guide wire and a first stop
15 positioned at a proximal portion of the guide wire;
delivering the distal end of the guide wire assembly to a location distal to the target site;
providing an undeployed filter attached to a sheath;
advancing the sheath over the guide wire to a distal portion of the guide
20 wire;
deploying the filter; and
fixing the position of the filter with respect to the guide wire.

65. The method of claim 64 wherein the step of fixing the position of
25 the filter comprises the step of locking the sheath to the guide wire.

66. The method of claim 65 wherein the step of locking the sheath comprises the step of disposing a sleeve about the proximal end of the sheath and the proximal portion of the guide wire.

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67. The method of claim 66 further comprising the step of firmly retaining the proximal end of the sheath within the sleeve.

68. The method of claim 66 further comprising the step of threading the sleeve to the guide wire.

5 69. A method of deploying an intravascular device, the method comprising the steps of:

inserting a guide wire into a vessel and maneuvering the guide wire to deliver a distal end portion of the guide wire to a target location in a vessel;

10 passing the intravascular device over the guide wire, whereby the intravascular device is freely rotatable and translatable with respect to the guide wire;

15 passing the intravascular device over a proximal stop on the guide wire to a deployment position on the distal end portion of the guide wire, the deployment position being located between the proximal stop and a distal stop on the guide wire; and

preventing the intravascular device from translating proximally beyond the proximal stop and distally beyond the distal stop.

20 70. The method of claim 69, wherein the intravascular device is a filter, the filter being passed over the guide wire in an undeployed condition and being expanded to a deployed condition upon reaching the deployment position.

71. A proximal stop mechanism for use with a guide wire deliverable in a vessel, comprising:

25 a one-way translation member affixed to the guide wire, wherein a device translatable disposed on the guide wire is allowed to translate proximally over the one-way translation member but is prevented from translating distally over the one-way translation member.

30 72. The proximal stop mechanism of claim 71 further comprising means for affixing the one-way translation member to the guide wire.

73. The proximal stop mechanism of claim 72 wherein the means for affixing comprises a solder bead.

74. The proximal stop mechanism of claim 72 wherein the means for affixing comprises a spring-loadable hinge.

75. The proximal stop mechanism of claim 71 wherein the one-way translation member comprises a low profile configuration and a high profile configuration.

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76. The proximal stop mechanism of claim 75 wherein the low profile configuration is useful for moving the mechanism through a lesion within a vessel.

77. The proximal stop mechanism of claim 75 wherein the high profile configuration is useful for preventing the device from translating proximally past the mechanism.

78. A locking mechanism for use with a guide wire deliverable in a vessel, comprising:

a sleeve member disposed over a distal portion of the guide wire, wherein the sleeve member has means for releasably locking the translational position of a device translatably disposed on the guide wire..

79. The locking mechanism of claim 78 wherein the sleeve member is made of a flexible material.

80. The locking mechanism of claim 78 wherein the sleeve member is threaded.

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